

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently amended): A method for forming ~~[[a]]~~ an insulating film, the method, comprising the steps of:

forming a base insulating film on a substrate; and

forming a high-k dielectric film on the base insulating film,

wherein the high-k dielectric film forming step includes:

~~[[a]]~~ the first step of depositing, in ~~[[the]]~~ a processing vessel, the high-k dielectric film under a first condition so as to allow a residence time of ~~[[the]]~~ a metal organic compound to extend to a first value; and

~~[[a]]~~ the second step for further depositing the high-k dielectric film under a second condition so as to allow the residence time of the metal organic compound to extend to a second value smaller than the first value.

2. (Currently amended): The method for forming ~~[[an]]~~ the insulating film of claim 1, wherein, in the first step, ~~[[the]]~~ a processing pressure in the processing vessel is set at a first processing pressure, and, in the second step, the processing pressure in the processing vessel is set at a second processing pressure which is lower than the first processing pressure.

3. (Currently amended): The method for forming ~~[[an]]~~ the insulating film of claim 1, wherein, in the first step, ~~[[the]]~~ a flow rate of a carrier gas or oxygen gas supplied into the processing vessel is set at a first flow rate, and, in the second step, the flow rate of the carrier gas or the oxygen gas is set at a second flow rate which is greater than the first flow rate.

4. (Currently amended): The method for forming ~~[[an]]~~ the insulating film of claim 1, wherein the high-k dielectric film is a crystalline film, and in the first step, crystalline nuclei of the high-k dielectric film are formed on the substrate.

5. (Currently amended): The method for forming ~~[[an]]~~ the insulating film of claim 1, wherein the metal organic compound is an organic compound containing Hf or Zr, and the high-k dielectric film is a HfO₂ film or a ZrO₂ film.

6. (Currently amended): The method for forming ~~[[an]]~~ the insulating film of claim 1, wherein the metal organic compound is tetra(tert-butoxy)hafnium, and the residence time is set to exceed 0.25 second in the first step and to be less than 0.25 second in the second step.

7. (Currently amended): The method for forming ~~[[an]]~~ the insulating film of claim 6, wherein, in the first step, ~~[[the]]~~ a processing pressure in the processing vessel is set to exceed 133 Pa, and in the second step, the processing pressure in the processing vessel is set at 133 Pa or below.

8. (Currently amended): The method for forming ~~[[an]]~~ the insulating film of claim 6, wherein, ~~in the first step, [[the]]~~ a processing pressure in the processing vessel is set at 200 - 400 Pa, and in the second step, the processing pressure in the processing vessel is set at about 40 Pa or below.

9. (Currently amended): The method for forming ~~[[an]]~~ the insulating film of claim 6, wherein the first and the second steps of the high-k dielectric film forming step are performed at a temperature of 450 °C or higher.

10. (Currently amended): The method for forming ~~[[an]]~~ the insulating film of claim 6, wherein the first and the second steps of the high-k dielectric film forming step are performed at a temperature of about 550 °C.

11. (New): The method for forming the insulating film of claim 1, wherein the first step is for forming nuclei of the high-k dielectric film on a surface of the substrate.

12. (New): The method of forming the insulating film of claim 11, wherein the second step is for uniformly growing crystal grains of the high-k dielectric film from the nuclei.

13. (New): A method for forming a high-k dielectric film comprising the steps of:

forming a base insulating film on a substrate in a processing vessel; and

forming the high-k dielectric film on the base insulating film in the processing vessel,

wherein the high-k dielectric film forming step includes:

the first step for supplying a metal organic compound gas and an oxidation gas into the processing vessel to form nuclei of the high-k dielectric film on the base insulating film under a first condition to allow a residence time of the metal organic compound gas in the processing vessel to extend to a first value; and

the second step for further supplying the metal organic compound and the oxidation gas into the processing vessel to uniformly grow grains of the high-k dielectric film from the nuclei under a second condition so as to allow the residence time of the metal organic compound gas in the processing vessel to extend to a second value which is smaller than the first value.

14. (New): The method for forming the high-k dielectric film of claim 13, wherein a surface roughness of the high-k dielectric film is to be controlled by the first and the second values.

15. (New): The method for forming the high-k dielectric film of claim 13, wherein the metal organic compound is an organic compound containing Hf or Zr, and the high-k dielectric film is a HfO₂ film or a ZrO₂ film.

16. (New): The method for forming the high-k dielectric film of claim 13, wherein the metal organic compound is tetra(tert-butoxy)hafnium, and the residence time is set to exceed 0.25 second in the first step and to be less than 0.25 second in the second step.

17. (New): The method for forming the high-k dielectric film of claim 16, wherein, in the first step, a processing pressure in the processing vessel is set to exceed 133 Pa, and in the second step, the processing pressure in the processing vessel is set at 133 Pa or below.

18. (New): The method for forming the high-k dielectric film of claim 16, wherein, in the first step, a processing pressure in the processing vessel is set at 200 - 400 Pa, and in the second step, the processing pressure in the processing vessel is set at about 40 Pa or below.

19. (New): The method for forming the high-k dielectric film of claim 16, wherein the first and the second steps of the high-k dielectric film forming step are performed at a temperature of 450 °C or higher.

20. (New): The method for forming the high-k dielectric film of claim 1, wherein a surface roughness of the high-k dielectric film is controlled by the first and the second values.